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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,037	02/24/2004	Akira Sugiyama	60896 (70551)	3898
21874 7590 01/22/2008 EDWARDS ANGELL PALMER & DODGE LLP P.O. BOX 55874 BOSTON, MA 02205			EXAMINER MOORE, KARLA A	
			ART UNIT	PAPER NUMBER
			1792	
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			01/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/787,037	<b>Applicant(s)</b> SUGIYAMA, AKIRA	
	<b>Examiner</b> Karla Moore	<b>Art Unit</b> 1792	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-6, 8-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,406,590 to Ebata et al. in view of U.S. Patent No. 5,948,165 to Tamura.
3. Ebata et al. disclose a plasma processing apparatus generating plasma under atmospheric pressure for processing an object (J) substantially as claimed in Figure 9, for example, and comprising: first (6) and second (5) electrodes adjacent to each facing a surface of the object to be processed; a dielectric (5 and 18) having a first opposing surface positioned spaced apart from the surface of the object between the object and said first electrode and a second opposing surface positioned between the object and said second electrode, and completely filled between said first and second electrodes; gas supplying means (3) having a supply opening (4) formed in said first opposing surface for supplying a processing gas to the surface of the object through said supply opening; and gas exhausting means (1) provided inside said second electrode having an exhaust opening (2) formed in said second opposing surface for

exhausting the processing gas supplied to the surface of the object through said exhaust opening.

4. However, Ebata et al. fail to teach the first and second electrodes having coated surfaces and said dielectric covering said coated surfaces.

5. Tamura teaches the provision of an intermediate layer between an electrode and a dielectric for the purpose of joining the electrode and the dielectric and for the purpose of providing a material having extendability for absorbing thermal deformation of either of the two (abstract).

6. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an intermediate coating layer on the electrode surfaces and between the dielectric and the electrode in order to join the electrode and the dielectric and in order to provide a material extendability for absorbing thermal deformation of either of the two as taught by Tamura.

7. With respect to claim 3, in Figures 9 and 10, Ebata et al. teach providing around said gas supplying means and said gas exhausting means, an inner wall formed of a dielectric material is provided.

8. With respect to claim 4, as the surfaces of the dielectric extends on a plane parallel to the surface of the object, so too would a coating provided thereon.

9. With respect to claims 5, during an intended use of the apparatus, an electric line of force connecting said first and second electrodes when a voltage is applied between said first and second electrodes would extend above and substantially parallel to the surface of the object. However, it is also noted that the courts have ruled that claims

directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

10. With respect to claim 6, said supply opening and said exhaust opening are provided in a vicinity of a region positioned between said first opening surface and said second opposing surface.

11. With respect to claim 8, said supply opening and said exhaust opening are formed to have a slit-shape in one direction or formed as a plurality of pores arranged in one direction.

12. With respect to claim 9, Ebata et al. teach that a gap (D) between the electrodes (5 and 6) and the stage (T) supporting the object is sufficiently small such that the gas supplied into the processing region is unlikely to flow into atmosphere (i.e. not be discharged through the gas exhausting means), such that the processing region is necessarily held at a high pressure (Figure 4; column 17, rows 17-52; column 19, rows 56-59); thereby suggesting that it is ideal for any gas supplied into the processing region gas supplying means be exhausted from the processing region by the gas exhausting means, rather than any other means. Therefore, the desirability of the claimed feature would have been obvious to one of ordinary skill in the art exercising ordinary creativity, common sense and logic. In that connection, the courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

13. With respect to claim 10, although specific relationships between the positions of the electrodes with respect to the positions of the supply and exhaust openings are not

explicitly taught in Ebata et al, it is taught that the number and position of the supply openings and exhaust openings can be tailored as needed (e.g. Ebata et al. column 28, rows 55-62). Further, as noted above, the courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

14. With respect to claim 12, Ebata et al. teach that the first electrode is surrounded by the second electrode, it would have been obvious to one of ordinary skill in the art exercising ordinary creativity, common sense and logic that the surrounding electrode could be provided as a single electrode or a plurality of electrodes and still possess the same processing capabilities, with the resulting apparatus being formed in symmetry with respect to the second electrode. The courts have ruled that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,406,590 to Ebata et al. in view of U.S. Patent No. 5,948,165 to Tamura and U.S. Patent Publication No. 20030213561 to Selwyn et al.

16. Ebata et al. disclose a plasma processing apparatus generating plasma under atmospheric pressure for processing an object (1) substantially as claimed in Figure 9 and comprising: first (6) and second (5) electrodes adjacent to each facing a surface of the object to be processed; a dielectric (5 and 18) having a first opposing surface

positioned spaced apart from the surface of the object between the object and said first electrode and a second opposing surface positioned between the object and said second electrode, and completely filled between said first and second electrodes; gas supplying means (3) having a supply opening (4) formed in said first opposing surface for supplying a processing gas to the surface of the object through said supply opening; and gas exhausting means (1) provided inside said second electrode having an exhaust opening (2) formed in said second opposing surface for exhausting the processing gas supplied to the surface of the object through said exhaust opening.

17. However, Ebata et al. fail to teach the first and second electrodes having coated surfaces.

18. Tamura teaches the provision of an intermediate layer between an electrode and a dielectric for the purpose of joining the electrode and the dielectric and for the purpose of providing a material having extendability for absorbing thermal deformation of either of the two (abstract).

19. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an intermediate coating layer on the electrode surfaces and between the dielectric and the electrode in order to join the electrode and the dielectric and in order to provide a material extendability for absorbing thermal deformation of either of the two as taught by Tamura.

20. Ebata et al. and Tamura disclose the plasma processing apparatus substantially as claimed and as described above.

21. However, Ebata et al. and Tamura fail to disclose said dielectric covering the electrode includes a recessed portion formed such that distance from the surface of the

object to said second opposing surface is made larger than distance from the surface of the object to said first opposing surface.

22. Selwyn et al. teach the provision of recesses (grooves) of varied placement, number, size and shape, as desired, on the surface of an electrode for the purpose of controlling the density, or aggressiveness of plasma chemistry (e.g. abstract and paragraphs 45, 48, 61).

23. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided recesses (grooves) of varied placement, number, size and shape, as desired, on the surface of the dielectric covered electrode of Ebata et al. in order to electrode in order to control the density, or aggressiveness of plasma chemistry as taught by Selwyn et al.

24. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebata et al. and Tamura as applied to claims 1, 3-6, 8-10 and 12 above, and further in view of U.S. Patent No. 5,198,724 to Koinuma et al.

25. Ebata et al. and Tamura disclose the plasma processing apparatus substantially as claimed and as described above.

26. However, Ebata et al. and Tamura fail to teach an apparatus further comprising a grounded conductive cover provided to cover externally exposed surfaces of said first and second electrodes.

27. Koinuma et al. teach providing a grounded conductive cover (Figure 2, 23 and 28) to cover externally exposed surfaces of first and second electrodes of a plasma



processing apparatus. The cover is provided for the purpose of encasing the body of the plasma processing apparatus (see column 5, rows 26-32).

### ***Response to Arguments***

28. Applicant's arguments with respect to claims 1 and 3-12 have been considered but are moot in view of the new ground(s) of rejection. Ebata et al. and Selywn et al. disclose apparatus comprising first and second electrodes with gas supply and exhaust means provided therein and electrodes provided with recesses, respectively, along with the advantages of providing such features. Additionally, Tamura teaches the provision of an intermediate layer between an electrode and a dielectric for the purpose of joining the electrode and the dielectric and for the purpose of providing a material having extendability for absorbing thermal deformation of either of the two.

### ***Allowable Subject Matter***

29. The indicated allowability of claim 7 is withdrawn in view of the newly discovered reference(s) to Selwyn et al. A rejection based on the newly cited reference is above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

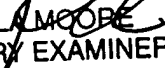
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
KARLA MOORE  
PRIMARY EXAMINER

10 January 2008